FEDERAL - STATE COOPERATIVE

SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

Arizona

By

Division of Irrigation, Soil Conservation Service

United States Department of Agriculture

Data included in this report were obtained by the agency named above in cooperation with the Federal, State and local organizations listed on the last page of this report.

As of

Jan. 15, 1953

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

TO RECIPIENTS OF COOPERATIVE SNOW SURVEY
AND WATER SUPPLY FORECAST REPORTS:

Forecasts by U. S. Weather Bureau of total annual streamflow October-September, inclusive, at more than 300 gaging stations are issued monthly January through May in the publication WATER SUPPLY FORECASTS FOR THE WESTERN UNITED STATES.

Weather Bureau forecasts of runoff presented in this bulletin are computed from procedures based on mathematical analysis of the relation between precipitation and runoff.

The Weather Bureau bulletins may be secured by writing to:

Hydrologist in Charge
River Forecast Center
U. S. Weather Bureau
712 Federal Office Building
Kansas City 6, Missouri

FEDERAL-STATE COOPERATIVE

SNOW SURVEYS AND IRRIGATION WATER FORECASTS

FOR

ARIZONA

Report Prepared

by

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Division of Irrigation
Soil Conservation Service
Room 24, Post Office Building
Phoenix, Arizona

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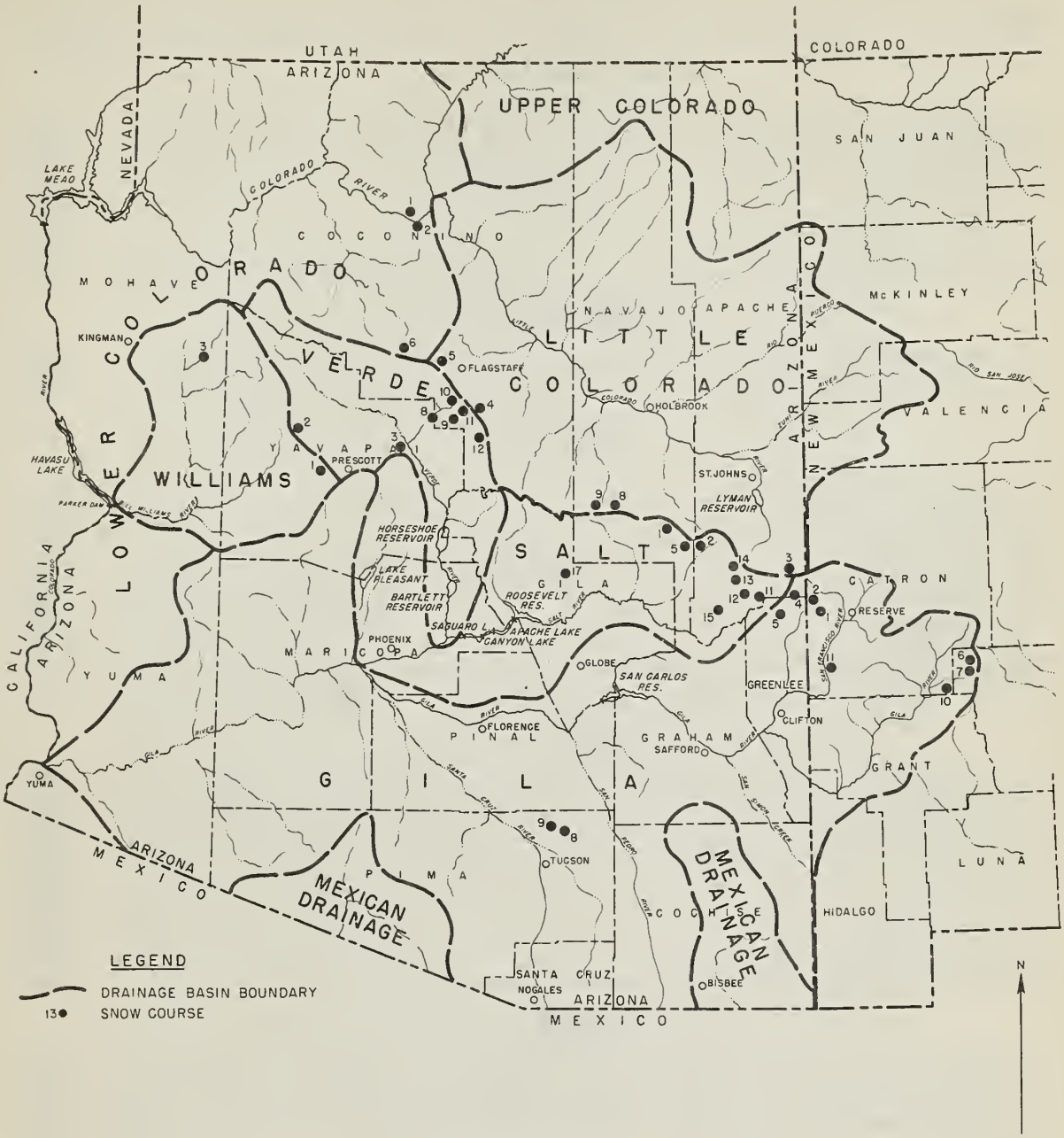

ARIZONA
COOPERATIVE SNOW SURVEYS

SNOW COURSES AND DRAINAGE BASINS
JANUARY 1953

0 40 80 120 160 200
SCALE IN MILES

AGR-SCS-ALBUQUERQUE, N. MEX M-178 NOVEMBER 1952

INDEX TO SNOW COURSES

NUMBER	NAME	ELEVATION
	LITTLE COLORADO RIVER	
1.	Forest Dale	6,000
2.	McNary	7,200
3.	Nutrioso	8,500
4.	Mormon Lake	7,350
5.	Fort Valley	7,350
8.	Heber	7,600
9.	Canyon Creek	7,500
11.	Mormon Mountain	7,500
12.	Happy Jack	7,630
	WILLIAMS RIVER	
1.	Iron Springs	6,200
2.	Camp Wood	5,700
3.	Willow Ranch	5,000
	GILA RIVER	
1.	Frisco Divide (N.M.)	8,000
2.	State Line (N.M.)	8,000
3.	Nutrioso	8,500
4.	Coronado Trail	8,000
5.	Beaver Head	8,000
6.	Taylor Creek (N.M.)	7,850
7.	Inman (N.M.)	7,800
8.	Rose Canyon	7,300
9.	Bear Wallow	8,100
10.	Black Canyon (N.M.)	6,790
11.	Mogollon (N.M.)	7,000
	VERDE RIVER	
1.	Iron Springs	6,200
2.	Camp Wood	5,700
3.	Mingus Mountain	7,100
4.	Morman Lake	7,350
5.	Fort Valley	7,350
6.	Chalender	7,100
8.	Munds Park	6,500
9.	Casner Park	6,930
10.	Antelope Park	7,300
11.	Mormon Mountain	7,500
12.	Happy Jack	7,630
	SALT RIVER	
1.	Forest Dale	6,000
2.	McNary	7,200
3.	Nutrioso	8,500
4.	Coronado Trail	8,000
5.	Milk Ranch	7,000
8.	Heber	7,600
9.	Canyon Creek	7,500
11.	Big Lake Knoll	8,800
12.	Maverick Fork	9,050
13.	Baldy	9,000
14.	Ft. Apache	9,160
15.	Pacheta	7,800
17.	Workman Creek	6,900
	LOWER COLORADO RIVER	
1.	Bright Angel	8,400
2.	Grand Canyon	7,500
5.	Fort Valley	7,350
6.	Chalender	7,100

WATER SUPPLY OUTLOOK

Arizona
January 15, 1953

* *

Water stored in snow on the principal watersheds of Arizona available for potential runoff is generally below normal. However, most watershed soils are well saturated beneath the snow at the present time. This will encourage more runoff than can be expected from the snow cover alone.

* *

Snow Cover

Salt River Watershed

On the Salt River watershed the snow-stored water varies from practically zero in the Forestdale-Showlow area to two inches of water in 11 inches of snow at Heber to over four inches of water in 25 inches of snow in the higher elevations of the White Mountains at Maverick Fork and Baldy Mountain, where water content averages about three inches. At this time last year the average snow-water content on this latter area was over five inches.

Verde River Watershed

On the Verde River watershed snow depths vary from a trace at Mingus Mountain to 9 inches around Ft. Valley, and 17 inches at Mormon Mountain. The water content in these areas varies from zero at Mingus Mountain to 5 inches at Mormon Mountain, averaging about three inches. At this time last year the average snow-water content was over five inches.

The most encouraging aspect of the water picture on these two watersheds is the hold-over reservoir storage which is available now, over 1,000,000 acre feet as a result of last year's runoff in the Salt and Verde River reservoirs.

Gila River Watershed

Water stored in snow on the Gila River watershed varies from zero at Mogollon and Black Canyon through nine inches at State Line to 13 inches at Beaverhead. The water content varies from zero over about half of the area through two

inches at State Line to over three inches at Beaverhead, averaging about 1 inch. At this time last year, the average was about two inches.

Soil conditions range from wet and frozen to saturated. Also, reservoir storage in the San Carlos Reservoir is less than 4,000 acre feet.

Snow-stored water on the Little Colorado is a little below normal, but only about 55 percent of what it was at this time last year. Williams River drainage is below normal, having no snow-stored water, whereas at this time last year there was 130 percent of normal.

The South Rim of the Grand Canyon reports six inches of snow with 1.5 inches of water, about 50 percent of normal. The North Rim of the Grand Canyon reports 22 inches of snow with six inches of water, about 80 percent of normal.

The runoff season is not sufficiently advanced to allow for definite forecasts as yet for runoff or reservoir filling. During the first week of February, further snow surveys will be conducted by the Salt River Valley Water Users Association and Soil Conservation Service. Following these surveys, runoff forecasts jointly developed by the Soil Conservation Service -- SRVWUA, and the U. S. Weather Bureau will be released.

TABLE 1

ARIZONA SNOW SURVEYS JANUARY 15, 1953

Drainage Basin and Snow Course	LOCATION No.	Sec.	Twp.	Rge.	Elev.	Date of Survey	Snow Depth (Inches)	SNOW COVER MEASUREMENTS Water Content(Inches) 1953	1952	1951	Past Record Years of Record	Avg.Water Content (Inches)
LITTLE COLORADO RIVER												
Forest Dale	1	2	9N	21E	6000	No Survey	T	0*	0	0.8	13	1.0
McNary	2	14	8N	23E	7200	No Survey	4.0[a]	1.0[a]	2.6	2.8	13	2.3
Nutrioso	3	23	6N	30E	8500	1/15	3.7	0.8	2.6	0.3	13	1.9
Mormon Lake	4	13	18N	8E	7350	1/14	11.8	2.5	5.8	0.9	6	3.8
Fort Valley	5	22	22N	6E	7350	1/15	9.4	2.4	6.4	T	6	2.8
Gentry	7	36	11N	15E	7600	1/15	6.2	1.9	N.S.	1.5	2	2.3
Heber	8	28	11N	15E	7600	1/15	11.0	2.4	N.S.	1.1	2	1.9
Canyon Creek	9	18	11N	15E	7500	1/15	13.2	3.0	N.S.	1.1	2	2.3
Mormon Mt.	11	14	18N	8E	7500	1/14	17.3	5.0	9.0	1.0	3	5.4
Happy Jack	12	30	17N	9E	7630	No Survey			6.6	0.2	2	3.3
Average							8.5	2.1	4.7	0.9		2.7
GILA RIVER												
Frisco Divide	1	31	6S	20W	8000	1/15	7.3	2.0	2.0	1.3	13	1.7
State Line	2	6	6S	21W	8000	1/15	9.0	2.2	2.4	0.9	13	2.2
Nutrioso	3	23	6N	30E	8500	1/15	3.7	0.8	2.6	0.3	13	1.9
Coronado Trail	4	26	5N	30E	8000	1/15	10.1	2.5	3.6	0.6	13	3.0
Beaver Head	5	13	4N	30E	8000	1/15	13.6	3.7	N.S.	0.6	11	2.4
Taylor Creek	6	20	10S	10W	7850	1/15	0	0	0	1.5	9	0.7
Inman	7	6	11S	10W	7800	1/15	0	0	0	1.5	7	0.5
Rose Canyon	8	15	12S	16E	7300	1/14	T.	0	0	1.4	5	0.7
Bear Wallow	9	6	12S	16E	8100	1/14	13.4	3.9	0	2.0	5	2.4
Black Canyon	10	8	13S	11W	6790	1/16	0	0	New Course			
Mogollon	11	2	11S	19W	7000	1/16	0	0	New Course			
Average							5.2	1.4	1.2	1.1		1.7

*Based on observation a - Partly estimated, subject to confirmation.

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WILLIAMS RIVER												
Iron Springs	1	22	14N	3W	6200	1/15	0	0	2.5	T	7	0.5
Camp Wood	2	3	16N	6W	5700	1/15	0	0	1.0	1.5	7	1.1
Willow Ranch	3	16	21N	11W	5000	1/16	0	0	0.8	2.8	7	1.7
Average							0	0	1.4	1.4		1.1
SALT RIVER												
Forest Dale	1	2	9N	21E	6000	No Survey	T	0*	0	0.8	13	1.0
McNary	2	14	8N	23E	7200	No Survey	4.0	1.0[a]	2.6	2.2	13	2.3
Nutrioso	3	23	6N	30E	8500	1/15	3.7	0.8	2.6	0.3	13	1.9
Coronado Trail	4	26	5N	30E	8000	1/15	10.1	2.5	3.6	0.6	13	3.0
Milk Ranch	5	28	8N	23E	7000	No Survey	4.0	1.0[a]	0	1.8	12	1.3
Gentry	7	36	11N	15E	7600	1/15	6.2	1.9	N.S.	1.5	3	2.3
Heber	8	28	11N	15E	7600	1/15	11.0	2.4	N.S.	1.1	3	1.9
Canyon Creek	9	18	11N	15E	7500	1/15	13.2	3.0	N.S.	1.1	3	2.3
Maverick Fork	12	13	6N	27E	9050	1/16	21.1	4.5	12.1	1.2	3	5.9
Baldy	13	28	7N	27E	9000	1/16	21.2	3.9	9.1	1.6	3	4.5
Ft. Apache	14	18	7N	27E	9000	1/16	25.1	3.6	9.5	1.9	3	4.6
Pacheta	15				7800	1/15	12.1	4.9	6.7	1.7	3	3.8
Workman Creek	17	33	6N	14E	5860	1/14	20.6	6.3	3.1	-- New Course		
Average							11.7	2.7	4.9	2.7		2.9

*Based on observation a - Partly estimated, subject to confirmation

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ARIZONA SNOW SURVEYS JANUARY 15, 1953

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VERDE RIVER												
Iron Springs	1	22	14N	3W	6200	1/15	0	0	2.5	T	7	0.5
Camp Wood	2	3	16N	6W	5700	1/15	0	0	1.0	1.5	7	1.1
Mingus Mt.	3	3	15N	2E	7100	1/15	0	0	1.4	T	6	1.0
Mormon Lake	4	13	18N	8E	7350	1/14	11.8	2.5	5.8	0.9	6	3.8
Fort Valley	5	22	22N	6E	7350	1/15	9.4	2.4	6.4	T	6	2.8
Chalender	6	27	22N	3E	7100	1/15	11.6	3.3	5.6	0.6	6	5.0
Munds Park	8	7	18N	7E	6500	No Survey			2.1	0.9	3	1.9
Casner Park	9	19	18N	8E	6930	1/14	13.4	3.6	5.8	1.2	3	3.8
Mormon Mt.	11	14	18N	8E	7500	1/14	17.3	5.0	9.0	1.0	3	5.4
Happy Jack	12	30	17N	9E	7630	No Survey			6.6	0.2	2	3.3
Average							7.9	2.1	4.6	0.6		2.9
COLORADO RIVER												
Bright Angel	1	34	33N	3E	8400	1/15	22.1	6.2	17.2	0.9	5	7.6
Grand Canyon	2	21	30N	4E	7500	1/15	6.1	1.5	3.0	1.5	5	2.6
Fort Valley	5	22	22N	6E	7350	1/15	9.4	2.4	6.4	T	6	2.8
Chalender	6	27	22N	3E	7100	1/15	11.6	3.3	5.6	0.6	6	5.0
Average							12.3	3.4	8.1	0.8		4.5

TABLE 2

STATUS OF RESERVOIR STORAGE, January 15, 1953

Basin and Stream	Reservoir	Usable Capacity (1000 A.F.)	THOUSANDS ACRE FEET IN STORAGE About Jan. 15				
			1953	1952	1951	1950	10 Yr.Av 1942-195
Agua Fria	Lake Pleasant	178	82	104	6	7	12
Colorado	Lake Havasu	688	579	597	620	684	555
Colorado	Lake Mohave	1,810	1,602	1,580	1,186	---	---
Colorado	Lake Mead	27,935	19,483	17,648	17,951	19,446	20,149
Gila	San Carlos	1,285	4	36	0	90	185
Verde	Bartlett	180	4	73	3	39	24
Verde	Horseshoe	143	4	54	2	2	6[a]
Salt	Roosevelt	1,382	1,019	180	3	363	495
Salt	Apache	245	238	161	170	192	130
Salt	Canyon	58	57	48	48	7	23
Salt	Saguaro	70	32	33	38	22	14

a - Average for years 1946 through 1951

LIST OF SNOW SURVEYORS

SNOW COURSE	SURVEYOR
Forest Dale	Indian Service
McNary	Indian Service
Milk Ranch	Indian Service
Casner Park	West and Griner
Munds Park	West and Griner
Mormon Mountain	West and Griner
Mormon Lake	West and Griner
Mingus Mountain	M. F. Jones
Iron Springs	E. Saxby
Camp Wood	Mrs. C. C. Merritt
Willow Ranch	T. Miller
Grand Canyon	Schuft and Major
Bright Angel	Valentine and Bateman
Fort Valley	A. P. Loska
Chalender	M. C. Oleson
Bear Wallow	Wm. Hughes
Rose Canyon	Wm. Hughes
Pacheta	Foch Phillips
Maverick Fork	West and Griner
Baldy	West and Griner
Ft. Apache	West and Griner
Taylor Creek	F. M. Inman
Inman	F. M. Inman
Coronado Trail	Pfefferle and Casanova
Nutrioso	Pfefferle and Casanova
Happy Jack	E. Ryberg
Workman Creek	C. L. Moore
Beaver Head	J. Burke
State Line	J. B. Shumate
Frisco Divide	J. B. Shumate
Gentry	Moody and Pattison
Heber	Moody and Pattison
Canyon Creek	Moody and Pattison
Mogollon	J. R. Wray
Black Canyon	E. Van Winkle

The following organizations cooperate in the Arizona snow survey work:

FEDERAL

Department of Agriculture
- Forest Service
  - Apache Forest
  - Coconino Forest
  - Coronado Forest
  - Gila Forest
  - Kaibab Forest
  - Prescott Forest
  - Sitgreaves Forest
  - Southwestern Forest and Range Experiment Station, Fort Valley, Arizona
  - Sierra Ancha Experiment Forest Station
- Soil Conservation Service
  - Division of Irrigation

Department of Commerce
- Weather Bureau
  - Arizona Section

Department of Interior
- Bureau of Reclamation
  - Region III
- Geological Survey
  - Arizona District
- Indian Service
  - Fort Apache Reservation
- National Park Service
  - Grand Canyon National Park

Gila Water Commissioner, Safford, Arizona

IRRIGATION PROJECTS

Salt River Valley Water Users' Association, Phoenix, Arizona

San Carlos Irrigation and Drainage District, Coolidge, Arizona

SOUTHWEST LUMBER MILLS, INC., McNary, Arizona

Other organizations and individuals furnish valuable information for the snow survey reports. Their co-operation is gratefully acknowledged.

Federal - State - Private

COOPERATIVE SNOW SURVEYS

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Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"